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**CLAIMS PTO** 

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China (Withdrawn): A method for aiding product life cycle planning, comprising setting product use period and langust part assful life of product; determining product use period \$ 0.5 x langust part methol life, and submanically proposing reason of parts when product use period \$ 0.5 x langust part assettal life is satisfied.

Claim 2 (Withdrawn): A method for aiding product life eyele placeing, comprising; generating information concerning worth degradability wherein worth detemperation of parts eclases to discard of product and cost rates of parts to a whole product and extracting, from the information, parts which is impossible to appealer and has highest worth degradability as improvement, object parts.

Claim 3 (Withdrawn): A method for adding product life cycle planning, comprising: generating information recovering use period and estful life of parts; and extracting, from the information, parts which is impossible to apprade and has sharess use period as amprovement object parts.

Claim 4 (Withdraway: A method for alding product tile cycle planning, comprising: 
'generating information concerning use period and useful life of parts; and 
extracting, from the information, parts whose maintenance replacement is impossible 
and whose useful life is should as improvement object parts.

planning, comprising:

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generating information converning was puried and useful life of parms; and

- extracting, from the information, parts whose maintenance replacement is impossible and whose useful life is shortest as improvement object parts.
  - A method for adding product life cycle planning, comprising:
- generating information concerning pust ratio of parts to a whole product and environment load ratio; and

Oxto Auting rouse candidate parts from the information.

- 6. A method eccording to claim 5, comprising:
  1. producing a two-dimensional graph wherein the cost
  ratio and the environment lead ratio are indicated by
  axes, based on the information; and
  - dividing the graph into a plurality of domains, and
- 20 said extracting step including extracting the reuse candidate parcs from at least one of the domains 15 which parts are existed.
- A method emorating to claim 5, comprisings
  generating information concerning cost satio of
  parts to the whole product and environment load ratio;
  producing a two-dimensional graph wherein the cost

fatio and the anvironment load ratio are indicated by

axes based on the information:

assigning each part to one of division donain

obtained by dividing the graph based on a given
threshold; and

extracting a reuse candidate part from a demain in which parts are existed.

Claim 5 (Withdrawn): A method for sliding product life cycle planning competiting:
generating information contenting a use period of reuse source product it, a remaining useful life of parts j to be included in the reuse source product, a use period of cease destination product it, a production period of reuse is uncerproduct a and a production period of reuse destination product it and determining that parts is possible to reuse only in the case where the remaining useful life of parts j to be included in the reuse course product remains more than the use period of reuse destination product if or on if the use period of reuse source product a re-schipsod, and wheth of parts j continues even if time hay until production of reuse destination product if it stanted, the production period of reuse source product if it stanted, the production period of reuse source product i is changed within the production period of reuse destination product i based on the information.

Chim 9 (Withdown): An apparato; for aiding product life cycle planting, comprising:

- a setting device configured to set product use period and longest purt useful life of product:
- a determination socision configured to determine product use period  $\le 9.5$  x longest gain useful life, and
- a groposing device configured to automaze ally propose reuse of parts when product  $\cos period \le 0.5$  x langest part useful life is satisfied.

Claim 10 (Withdrawn): An appurates for aiding product life cycle planting, comprising:

A agentrates configured to generate information concerning worth deproductibility wherein worth deterioration of parts relates to distant of product and cost ratio of parts to a whole product, and

so extracting device configured to extract, them the information, parts which is corposible to uporate and has highest worth degradability as unprovement object parts.

Claim 11 (Withdrawn). An approxius for aiding product life cycle glanning, compraing:

a generate configured to generate information concerning uso period and useful life of parts; and

so extracting device configured to extract, from the information, parts which is appossible to upprade and has shortest use period as improvement object parts.

Chilm 12 (Withdrawn): An apparatus for siding product life type planning, comprising:

is generated configured to generate information economing use period and useful life of parts, and

an extracting device configured to extract, from the information, parts whose productions replacement is impressible and whose usefulation is shortest as improvement object parts.

- An apparatus for Riding product life cycle planning, comprising;
  - A generator configured to generate information concerning cost ratio of pares to a whole product and environment load ratio; and
  - an extraction device configured to extract reuse condidate parts from the information.
    - 14. An apparates According to claim 13, comprising:
    - a production device configured to produce a two-dimensional graph wherein the cost ratio and the environment load ratio are indicated by axes, based on the information; and
    - a dividing dovice configured to divide the graph into a plurality of domains, and
- 25 raid extraction decion extracting the reuse candidate parts from at least one of the decains in which parts are existed.

15. An epparatus according to claim 13, comprising:

a generating device configured to generating information concerning test ratio of parts to the whole product and environment load ratio:

- a producing device configured to produce a two-dimensional graph wherein the cost ratio and the confrontent lead ratio are indicated by exemples on the information:

on essigning device configured to assign each park to one of division densin obtained by dividing the except based on a given threshold, and

an abtracting device configured to extract a reuse candidate part from a domain in which parts are extract

a generate configured to generate information concerning a use period of reuse source product et a remaining useful life of pures j to be included in the reuse source product. a use period of reuse destination genduct if, a production period of reuse source product i and a production period of reuse destination product if and

means for determining that ports is possible to reuse only in the case where the manufaing useful life of parts j to be included in the reuse source product eccusins more form the use period of reuse destination groduct i even if the use period of reuse source product i st clayed, and worth of parts j continues even if time lag until production of reuse destination product i is started, the production period of reuse source product i and the use period of cause destination product i' are considered, and the amount of recovery of reuse source product i is enough within the, production period of reuse destination product? based on the information.

Claim 17 (Wathdrawn). A program product for abling product life cycle planning, comprising:

treams for immucing a consputer to prepare product use period and longest part useful life of product;

means for instructing the computer to determine product use period  $\leq 0.5$  x longest part without life, and

means for extracting the computer to propose parts reaso to the new product when muture use period 2.0.3 x foregors part useful file is satisfied.

if. A program product for aiding product life cycle planning comprising;

radas for instructing a computer to propara information concerning cost ratio of parts to a whole product and environment loss Africa

means for instructing the computer to produce

Claim 16 (Withdrawe): An apparatus for aiding product title cycle planning openicing:

Claim 19 (Withdrawn): A program product the siding product life cycle placeting, comprising:

means for instructing a computer to generate information concerning a use period of reuse source product a, a remaining aveinf late of parts j to be included in the news source product, a tise period of reuse destination product if, the production period of reuse source product i and a production period of reuse destination product it and

means for instructing the computer to determine that pasts is possible to reuse only in
the case where the remaining, useful life of pasts j to be included, in the reuse source product
remains more than the use period of reuse destinations product if even if the use period of
reuse source product is selepted, and weeth of pasts j contest, go on if time tag until
production of tenne destination product if a vitated, the production period of reuse source
product i and the use period of reuse destination groduct if the considered, and the amount of
recenery of reuse source product i is enough within the production period of reuse destination
product if based on the information.

Claim 20 (Withdrawn): A program product for adding ground life cycle planning according to claim, 19, comprising means be instructing to set the product use period such that a combining useful life of parts j to be ignlisted in the reasonamen product convints more than the use period of reuse destination product if even if the use period of reuse source product it is clapsed.

Chim 21 (Withdrawn): A program product for aiding product life tyele planning comprising:

means for instructing a computer to prepare information concerning worth degradability wherein worth deterioration of pants actives in discard of product and cost ratio of parts to a whole product:

means for instructing the computer to extract pe whose cost ratio exceeds threshold and whose worth degradability is highest as improvement object parts; and

means for instructing to propose in repensive appendix wherein cost tasio is not more than the short the inspersement object parts.

Chim 22 (Watherson): A program product for aiding product life cycle planning comprising:

means for instructing a computer to prepare information contensing ose period of parts and cost ratio of parts in a whole groduct,

means for instituting the computer to extract pany whose cost racks exceeds threshold and whose use period is abortest as improvement object parts; and

means for instructing to propose inexpercise appeads wherein cost ratio is not more than threshold about the improvement object pans.

Claim 23 (Withdrawn): A program product for siding product life cycle planning concentrates

meant for instructing a computer to prepare information concenting useful life of parts:

means for instructing the computer to extract parts whose maintenance replacement is impossible and whose could life is shortest as improvement object parts; and

means for instructing the constitute to propose maintenance about the improvement object parts.

CMn 24 (Withdrawa): A program product for aiding product life cycle planning comprising:

means for instructing a computer to perpute information concerning use period and useful life of purity

means for instructing the computer to extract parts where cost ratio executs threshold and whose useful life is shortest as improvement object parts; and

incrins for costructing the computer to propose the openione maintenance wherein cost ratio is not more than threshold about the improvement object pairs.

Claim 23 (Withdrawn): A program product for uithing product life cyris planning comprising:

jumns for estructing a computer to persone information concerning degratation and abusiveness of parts and cost rate of parts to the whole product;

means for assimuling the computer to extract parts whose cost ratio exceeds threshold and whose degradation and abrasiveness are largest as improvement object parts; and

means for matrixing the computer to propose inexpensive maintenance wherein cost ratio is not more than threshold about the improvement object parts.



Chim 26 (Carrently Amended): A method for siding product bit cycle planning, compassing:

sening a threshold value reneeming tense of parts with respect to you test environment.

reading cost of parts and environment food information from a database;

displaying paris on a crap displayed on a display-densir undefended into a plurality of domains based on the theoriesis;

selecting remo every data party from the displayed parts with referencess the displayed map,

ralculat ný a useful félic based condition fizuncia expressed as follows:

min ita", h" 1 < ta" - min (la", h")

where  $\ln^2$  is a useful fall time of product i, h is a worth life time of product i. It is a useful life time of part  $j_i$  and h is a worth life time of part  $j_i$ 

determining whether the useful life based condition termida is startfed,

determining possibility of rease with respect to the rease condidate parts when the useful had based condition formula is consided,

calculating a worth life time based condition formula expressed as follows:

the off one (Lett. bet) & bet

where  $t_{a}$  is a time lag of product it, and  $t^{a'}$  is a production period of product it,  $b^{a'}$  is a worth life time of product it,  $t^{a'}$  is a worth life time of product it,  $t^{a'}$  is a worth life time of part  $p_{a}$ .

"V determining whether the worth life time based equilition farmula is satisfied; and determining possibility of some with respect to the reute Caracidate parts when the worth life time based condition formula is satisfied.

cakalining a recovery quantity based condition Critical expressed as follows:

 $\min\{\mathbf{h}^{-1},\mathbf{k}^{-1}\} \leq \mathbf{d}^{-1} + \alpha \mathbf{d}^{-1}$ 

where  $0 \le \alpha \le 1$ ,  $1a^{-i}$  is a useful lifetime of product i,  $h^{-i}$  is a worth lifetime of presser i,  $t_i^{-i}$  is a inverse of product i, and  $t_i^{-i}$  is a production period of product i.

determining whether the reviewery quantity based condition formula is satisfied.

[[and]]

determining on a computer possibility of coose with respect to the rease excellent parts when the recovery quantity based conditions formula is satisfied, and

desplaying the determination of possibility of rouse with respect to cause of candidge parts.

China 27 (Previously Presented): The method according to claim 26, wherein the map is disaded into four domains: a domain where'reuse should be actively examined, o domain where reuse should be fairly actively examined, a domain which fails to be suitable for reuse and a domain where reuse is examined.

Claim 28 (Previously Presented) The method moonling to claim 26, further Ministry

calculating a wanth life based condition formula for determining that worth of parts j satisfying the useful life based condition formula continues even if time lag and production of scare destruction product if is started, the production period of rease source product i and the use period of reuse destination product i are considered.

Claim 29 (Previously Previously). The method according to claim 28, wherein the most divided into four domains a domain where reuse should be actively examined, a domain where reuse should be fairly actively examined, a domain which fails to be suitable for reuse and a domain where reuse is examined.

Claim 30 (Previously Presented): An apparatus of aiding modula life eyele planning, camprising.

an input device configured to set a threshold value contenting tease of parts with respect to cost and covariantese.

is reading decree configuratio rest and opers and encurrences less information from a database.

a display device configured to display parts on a map divided into a plurality of domino haird on the threshold,

and esting device configured to select reuse cardidate para from the displayed parts with reference to the displayed stup;

a computing decide configured to calculate a useful life based condition forms is expressed as follows.

min (lu\*, lr\*) s la\*-min (lu\*, lr\*)

where  $\ln^d x$  a useful life time of product  $\ell$ , it  $^4$  is a worth life time of preduct i;  $\delta e^{it}$  is a useful life time of part j, and  $\delta e^{it}$  is a worth life time of part j.

a first determining unit configured to determine whether the useful life based condition formula is satisfied;

a second determining unit configured to determine possibility of reuse with respect to the reuse candidate parts when the useful life based condition formula is satisfied.

the computing device calculates a worth lefe time based condition formula expressed at follows:

it, "+ iP" + mus sta", in "1 & in"

where th' in a time by of product i', and tP' is a production panel of product i',  $ta^*$  is a useful life time of product i', tr'' is a worth life time of product i', and tr'' is a worth life time of product i', and tr'' is a worth life time of product i'.

the first determining with determining which on the worth life time based conduces bounds of satisfied, and

the second determining unit determines possibility of reuse with respect to the reuse cardidate purs when the worth life time based condition formula is satisfied;

The companies and celeulatera rotor try quartity besed treed sign Remidues pressed

min ila ', 11" | " il" + o th'

where 0 & g & 1, let' is a cortal life typic of purchast it, had it a wanth life time of product if , the is take tag of product if, and  $tP^{\lambda}$  is a production period of product if:

the that desermining unit determines whether the worth life time based condition formula is satisfied, and

the second determining unit determines possibility of reuse with respect to the coase candidate pears when the recovery quantity based condition formula is sufficient

Claim 31 (Previously Presented): The apparatus arounding to claim 10, wherein the map to divided lose foot domains, a domain, where recast should be attively extrained, a digratin where rease should be fairly actively examined, a domain which fails to be mitable for rouse and a domain where reuse is examined.

Châm 32 (Previously Presented): The apparatus according to claim 30, thinher comprising.

a computing device configured to calculate a worth life based conduiton formula for descripting that worth of parts j satisfying the useful life based condition formula continues even it time by and production of noise destination product it is started, the production period of cross source product kand the use period of rouse destination product if are cansidered.

Chim II (Previously Presented): The apparatus according to claim 12, wherein the map is divided into four domains: a domain where reuse should be actively examined, a domain where reuse should be feltly natively examined, a domain which fails to be suitable for reast and a domain where rouse is examined.

China 24 (Previously Presented): A computer residable recording medium contaming a recopular program to aide product life exple planning, the program comparing intractions

ser a fire establic value concentrally reaso of pairs with respect to cost and environment; read cost of parts and environment load enformation from a database; display pairs on a map divided izon a plurality of damains based on the threshold, receive a selection of rease candidate parts from the displayed parts with reference to the displayed rarp:



cultubile a useful life based condition formula expressed its follows:

non tla", h ") & ta'i- min tla", h")

where  $\mathbf{h}^{\mathbf{d}}$  is a useful  $\mathbf{f}$  fertime of product  $\mathbf{f}$ ,  $\mathbf{h}^{\mathbf{d}}$  is a worth lifetime of product  $\mathbf{f}$ ,  $\mathbf{h}^{\mathbf{d}}$  is a worth lifetime of part  $\mathbf{f}$ , and  $\mathbf{f}^{\mathbf{d}}$  is a worth lifetime of part  $\mathbf{f}$ .

determine whether the useful life based condition formula is satisfied; and

determine possibility of mane with respect to the rease candidate parts when the useful life based condition formula is satisfied;

calculate a work life time based condition fairfuls expressed as follows.

state of a mic state, in it is to it

where  $\Omega_i$  is a time by of product  $C_i$  and  $\Omega_i^0$  is a production period of product  $C_i$  by a worth life time of product  $C_i$  is a worth life time of product  $C_i$  and  $C_i$  is a worth life time of product  $C_i$ .

determine whether the useful life based condition Control is satisfied;

determine possibility (if couse with respect to the reuse candidate guits when the useful life based condition from as \$350,0100.

calculate a recovery quantity based condition formula expressed as follows:

min (12", 2") or all + mp"

where  $\theta \in \sigma(S)$  is a useful life time of product  $\ell$ , it is a worth life time of graduct  $\ell$ , it is a time tag of product  $\ell$ , and the same tag of product  $\ell$ ;

determine whether the worth Life time based condition forms above stansfied; and determine possibility of rause with respect to the rause candidate pairs when the recovery quantity based condition formula is stansfied.

Claim IS (Previously Presented): The program according to Claim I4, wherein the map is divided into four diamains in deman where reuse should be actively examined, a

domain where reuse should be fairly serively examined, a domain which hals to be sudable. For reasonal a domain where rouse is destroard.

Listen 36 (Provinusly Presented): The computer readable recording medium acrossing to claim 34, hurther comprising instructions to calculate a worth life based condition formula for discrimining that worth of parts y satisfying the useful life based condition formula continues even if time lag until production of reuse destination product i' is started, the production period of reuse source product i and the use period of reuse destination product i' are considered.

Claim 37 (Praviously Presented). The exemptor restable recording medium according to claim 36, wherein the map is divided 1000 feit domain 36, wherein the map is divided 1000 feit domain 36, wherein the map is divided 1000 feit domain 30.

should be actively examined, a domain where reuse should be fairly actively examined, a domain wheelt fails to be suitable for rouse and a domain where rouse is examined.

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